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ABSTRACT

The Urban Project (UP) promotes minority advancement in the sciences and technologies for high school students demonstrating potential for math and science-based careers. UP students receive supplemental instruction in mathematics, science, computers, and basic skills at participating City College of New York campuses and are exposed to college and career requirements. This report attempts to: (1) link student social, demographic, and academic achievement variables to planning efforts; (2) longitudinally track the academic progress and retention patterns of participants from high school through college; and (3) stimulate research questions and activities. It contains demographic data on family, income, gender, ethnicity, birthplace, and family language as well as achievement data from grades nine through eleven. Findings suggest that UP is succeeding in retaining participants and in motivating them to pursue mathematics and science studies. Performance data indicate that participants attempt and complete advanced college preparatory courses in mathematics and science but that overall grade point averages have declined slightly over the past 3 years. In addition to the profile of UP students, recommendations from the consortium who operate the program are provided throughout the report. (LHW)

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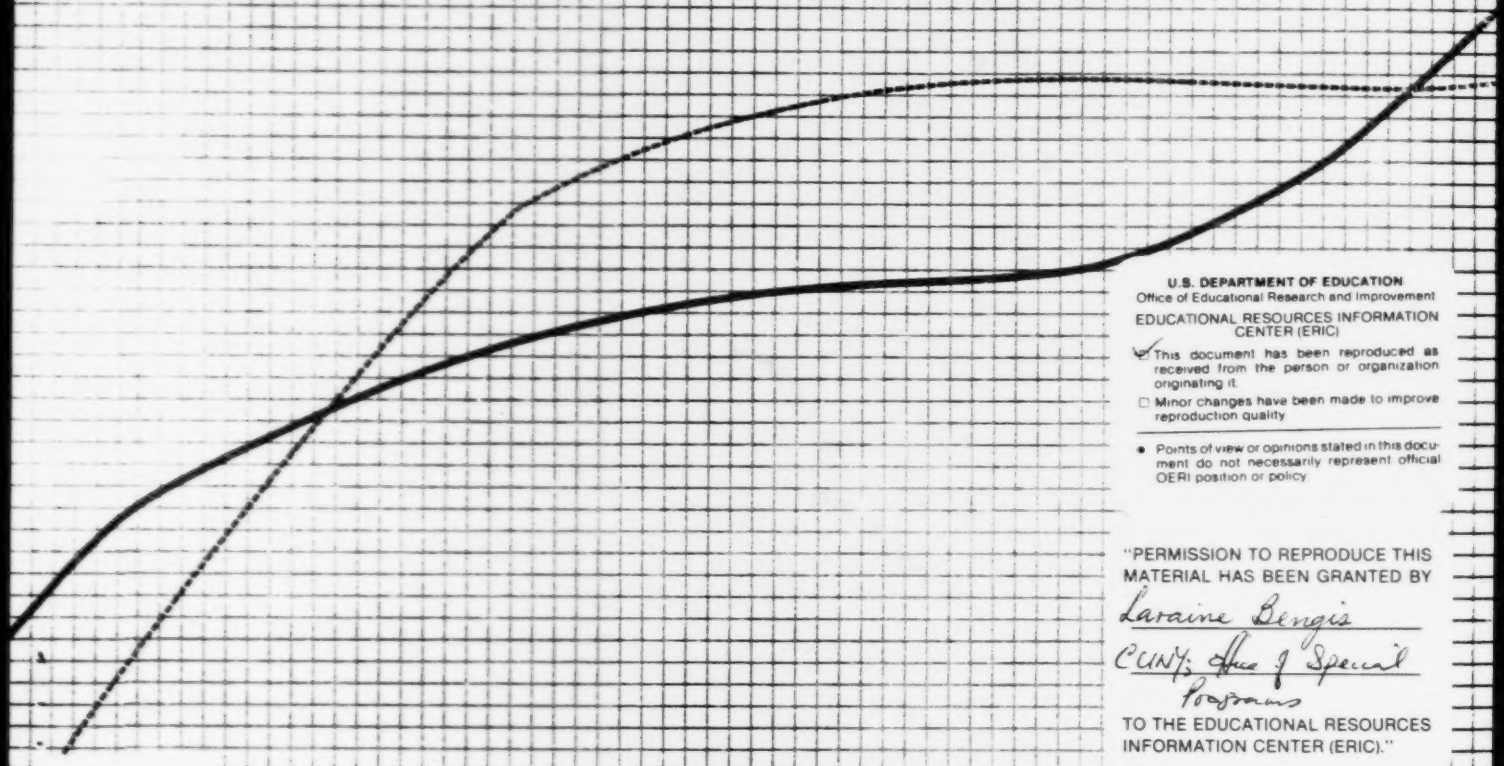
Urban Project Student Profile:

A Longitudinal Analysis from the Ninth through the Eleventh Grade

June 1981-June 1983



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Laraine Bengis

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URBAN PROJECT STUDENT PROFILE:

A LONGITUDINAL ANALYSIS FROM THE NINTH THROUGH THE ELEVENTH GRADE

(June 1981 - June 1983)

City University of New York
Office of Special Programs

Research and Evaluation Unit
Laraine Bengis
Original Report, Fall 1983

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ABSTRACT

The Urban Project, created in 1981 with help from a Ford Foundation planning grant, is a program to promote minority advancement in the sciences and technologies for high school students who demonstrate potential for math and science-based careers. It is under the umbrella of the College Discovery and Development Program (CDDP), a City University of New York and Board of Education Consortium begun in 1964. Urban Project students receive supplemental instruction in mathematics, science, computers and the basic skills at participating CUNY campuses and are exposed to the realities of college and career requirements.

This report, a demographic and academic performance profile of students in the Project, is the second in a series of reports designed to: (1) link student social, demographic and academic achievement variables to planning efforts; (2) longitudinally track the academic progress and retention patterns of participants from high school through college; and (3) stimulate research questions and activities. The report contains demographic data on family income, gender, ethnicity, birthplace and family language and academic achievement data from the ninth through the eleventh grade (through June '83) on performance in English, mathematics and science courses and on Regents Examinations.

Presently, the Project is serving 156 CDDP students from the five participating high schools. Selection criteria for Project participation included demonstration of potential and motivation as evidenced by a high school average in the mid '70s to mid '80s and counselors' recommendations. As a sub-group of the larger CDDP population, the Urban Project students demographically resemble other CDDP students: they are from ethnic minority groups (with Black students predominating); females are in the majority; they come from poor families; they mainly attend high schools in impoverished neighborhoods; almost one-half were born in countries other than the mainland USA; and over one-third come from families where languages other than English predominate. Essentially, they come from the group most underrepresented in the science and technology fields.

Findings in this report suggest that the Urban Project is succeeding in retaining participants as well as in motivating them to pursue math and science studies. Retention figures show that four semesters after its inception, Project students have completed an average 84% of each of the Project activities begun; over 82% have been retained in their respective CDDP Programs and, by definition, in their high schools. This finding is significant in view of the staggering number of high school students who drop out, particularly during and after the tenth (or sophomore) year. In fact, New York City Board of Education figures reveal that only 45% of high school students graduate.

Performance data indicate that participants are attempting and completing advanced college preparatory courses in math and science, such as geometry, chemistry and physics, but that overall grade point average in English, math and science have declined over the past three years (from a 78 to 72 GPA). When compared to the 1980 CUNY entering class Urban Project students are better prepared for college level work in science and mathematics than either SEEK or CD students and slightly better prepared in science than senior college regularly admitted students.

An analysis of gender differences in the amount of math and science college preparatory course sequences completed revealed that the sexes were roughly equivalent in the amount of mathematics and science preparation received.

Even though many students have completed college preparatory courses, over one half of the eleventh grade participants were taking math courses appropriate to a lower grade level, such as algebra or geometry. A review of high school transcripts indicated, however, that some students were placed in "slow" math tracks despite having attained high grades in math courses (85+) prior to placement.

For students who attempted math and science courses and corresponding Regents Examinations, there was a gap between course grades and Regents grades, with Regents grades generally about 10 points lower.

Finally, it was important for Urban Project Planners to know how many students took computer courses in high school since the Project emphasizes and encourages computer literacy. Sixteen (16) students have taken one to four courses at their respective high schools.

The most salient recommendations are presented below for consideration by Consortium staff:

- Develop a comprehensive research design to: (1) link student academic achievement and retention patterns to Project results; and (2) longitudinally track the academic performance of Project participants and a comparable group of non-participants from high school through college.

- Compare Urban Project academic performance with that of the larger CDDP population over the same five semesters. Assuming corroborative findings that reveal a "downward" trend in academic performance conduct a study to determine reasons; develop appropriate strategies and timely interventions to maximize student performance and retention.

- Study the procedures used at the high schools to place students in math courses since data indicate that students may have been placed in math "tracks" which were below their level of skills attainment.

- Examine the relationship between course grades and Regents Exam grades for the larger CDDP population to ascertain how widespread grade discrepancies are and factors involved.

- Encourage more of the CDDP high schools to offer computer literacy courses.

- Interview a sample of Urban Project students who have participated steadily as well as those who dropped out to ascertain which aspects of the Program were successful in meeting students' needs and which could be improved, expanded upon or deleted.

- Continue to provide students with appropriate role models in the form of women and minorities in particular, who have succeeded in the math and science fields.

- Create a mentorship program with CUNY upper division students serving as mentors to Urban Project high school students. When possible, solicit SEEK and former CDDP students.

- Establish an Urban Project summer internship program enabling Project students to work with and learn from professionals who are interested in helping young minority students advance toward careers in the math and science fields.

INTRODUCTION

Background

The Urban Project, created in 1981 with help from a Ford Foundation planning grant, is a program for New York City Minority students who demonstrate potential for careers in the sciences and technologies. The Project is under the umbrella of the College Discovery and Development Program (CDDP), a City University of New York and Board of Education Consortium begun in 1964 to expand educational opportunities for high school youth who are underachieving academically. Urban Project students receive supplemental instruction in math, science, computers and the basic skills at participating CUNY campuses and are exposed to the realities of college and career requirements.

Using the combined resources of the public secondary and post-secondary systems, Project staff are developing an urban educational model which they anticipate will promote minority advancement in science and math-related careers.

The concerns facing the Urban Project are echoed nation-wide as educators lament the poor quality of math and science preparation and the underrepresentation of minorities in related fields. By the time students arrive at college it is all but impossible to bridge the gap necessary to pursue scientific or

mathematical careers. Consequently, many lucrative career options are closed to them forever.

Recognizing a need in the long operating CDDP for a more intense focus on science and math for students who have potential but who are nevertheless performing academically within an average range (mid 70's to mid 80's high school average), Consortium staff developed the Urban Project.

Perhaps the most significant outcome to date is that the Project is contributing to the national dialogue on how to improve math and science education by documenting the experiences of urban minority students.

Urban Project Student Profile

Since the creation of the Urban Project, CUNY's Office of Special Programs (which assumes direct operational responsibility for all CUNY Special Programs, of which CDDP is one) has been documenting the background and academic progress of the participating students. This report is the second in a series of profiles which: (1) link student social, demographic and academic achievement characteristics to planning efforts; (2) longitudinally track the academic progress and retention patterns of participants from high school through college; and (3) stimulate research questions and activities.

The first report examined demographic variables and academic achievement through the tenth or sophomore year (June '82); the present one updates demographics and continues to track academic performance through the eleventh or junior year (June '83).

Information for the reports are generated through an extensive computer file maintained by the Office of Special Programs on the larger CDDP population and the Urban Project sub-group. Elements in the database include variables such as family income, ethnicity, birthplace, family language and gender as well as ongoing high school performance data. Eventually, the CDDP Project file will be the basis for a longitudinal study comparing Project participants and a comparison group of CDDP non-participants.

Since the first profile report was issued the Urban Project has expanded from 130 to 156 students. Because of factors such as Project expansion, demographic as well as academic achievement data are garnered on a routine basis and used to determine trends, assess student needs and plan responsively.

An example of how the first profile informed program planning during the pilot year of the Project was the response of staff to findings that female participation exceeded male participation. Although not a surprising discovery, since females predominate in the larger CDDP population, it was significant in that, traditionally, men predominate in the

science and technology fields. This finding led to an expansion of female staff as role models and to an Educational Policy Seminar for Project staff on the topic of women and mathematics. Another example of responsive planning emanating from profile findings concerns the discovery that more than one-third of the participants come from families where languages other than English predominate and almost one-half were born outside the mainland USA. An English-as-a-Second Language (ESL) Computer Science Project is being developed to upgrade the language skills of ESL students while providing them with enrichment activities in math and science.

It is anticipated that the present profile report will continue to be a useful tool to Urban Project staff. The remainder of the report is divided into three sections: demographic profile; retention patterns; and academic achievement profile.

STUDENT DEMOGRAPHIC PROFILE

This section examines demographic variables that are related to academic performance: gender, family income, ethnicity, birthplace and family language. It concludes with recommendations to Urban Project administrators and staff.

Enrollment by High School and Gender

The 156 participating Urban Project students were selected from among those who entered CDDP as sophomores in Fall '81. They were recruited from all five of the CDDP high schools and comprise 31% of the entering class. Each of the participating schools (one in each borough of New York City) enrolls about 300 CDDP students at any one time, 100 in each of the three classes, sophomore, junior and senior.

Three of the five high schools (Theodore Roosevelt, Thomas Jefferson and Seward Park) are designated Chapter I schools (formerly Title I). Generally, students attending Chapter I schools live in neighborhoods characterized by extensive public housing, crowded living conditions, a high rate of crime and families receiving public assistance. Over 67% of the Urban Project participants attend Chapter I schools. These students must be two or more years behind in reading and/or mathematics to be accepted into CDDP. The remaining two high schools (Jamaica and Port Richmond) are tax levy schools. They recruit students

who have potential to succeed in college but who are underachieving.

Participants are fairly evenly represented in the Urban Project, except for Port Richmond which has disproportionately fewer students.

TABLE 1

URBAN PROJECT ENROLLMENT
BY HIGH SCHOOL AND GENDER

	Male		Female		Male and Female	
High School	N	%	N	%	N	% of Total
Theodore Roosevelt	19	54.3	16	45.7	35	22.4
Thomas Jefferson	7	20.6	27	79.4	34	21.8
Seward Park	17	47.2	19	52.8	36	23.1
Jamaica	14	38.9	22	61.1	36	23.1
Port Richmond	7	46.7	8	53.3	15	9.6
Total	64	41.0%	92	59.0%	156	100.0%

Of the total Project population of 156 students, 92 (or 59%) are females and 64 (or 41%) are males. Although enrollment has increased by 26 students since the last profile report, the gender distribution remains the same. This datum is consistent with the preponderance of females in the CDDP at large. Thomas Jefferson has noticeably fewer male participants than the other high schools.

Family Income

Because the CDD Program is targeted to the academically disadvantaged, with three of its five participating schools located in poverty areas of the City, it follows that the majority of Urban Project students come from poor families.

Ethnicity, Birthplace and Family Language

The Project, as intended, overwhelmingly serves the City's minority high school students, with Blacks predominating. This is consistent with the preponderance of minorities (Blacks, in particular) in the CDDP population. But, the number of participants from other minority groups is also significant (Hispanics 28.2%; Asians 12.8%).

Almost one-half of the students were born in countries other than the USA; over one-third come from families where the primary language is other than English.

TABLE 2

ETHNICITY, BIRTHPLACE AND FAMILY LANGUAGE
OF URBAN PROJECT STUDENTS

N = 156

Demographic Characteristics	All Centers Combined	
Ethnicity	N	Percent of Total
Black	87	55.8
Hispanic	44	28.2
Asian	20	12.8
Other	5	3.2
Birthplace		
USA	79	50.6
Asia	19	12.2
Caribbean	10	6.4
Puerto Rico	15	9.6
Other	4	2.6
Not Available	29	18.6
Family Language		
English	97	62.2
Spanish	35	22.4
Chinese	18	11.5
Japanese	2	1.3
Other	4	2.6

Figures above on national origin and native language of Urban Project students show that the largest number were born in Asian countries (12.2%) and the second largest in Puerto Rico (9.6%). While Spanish is the predominant family language next to English (22.4%), Chinese speaking families comprise 11.5% of the Urban Project families.

Summary

The Urban Project, designed to promote minority advancement in the sciences and technologies presently serves 156 CDDP students (or 31% of the Fall '81 entering class) from all five of the CDDP high school centers. The Project, as does the larger CDD Program, contains a preponderance of females, mainly students from minority groups (with Blacks predominating) and a large percentage who were born outside the mainland USA and come from families where languages other than English are primary.

Recommendations

Based on the considerations elaborated upon in the preceding pages it is suggested that the following recommendations be taken under consideration by the Consortium:

- Continue to utilize a cadre of Black, Hispanic and Asian men and women as role models to participants in the form of teaching staff and successful men and women in the science and math fields who come from backgrounds similar to those of Project students.

- Attempt to ascertain why males from Thomas Jefferson are underrepresented in the Urban Project.

STUDENT RETENTION PATTERNS

One important indication of the effectiveness of the Urban Project is the degree to which participants complete Project activities begun. Another is the rate at which they are retained in their respective CDD Programs and, by definition, in their high schools. Since Board of Education statistics show that only 45% of high school students graduate City-wide and that attrition is particularly high in high schools designated "Chapter I", retention is a crucial barometer of Urban Project impact.

Urban Project Participation and Retention Rates

Project participants have had four major activities available to them, all designed to provide specialized opportunities related to math and science. The Spring '82 Bridge Project provided supplemental instruction and activities at four CUNY Colleges: City College, Baruch College, Medgar Evers Community College and LaGuardia Community College. The Summer '82 Institute for Science and Technology, at LaGuardia Community College, provided participants with a five week integrated learning experience in math and science. The Spring '83 Pre-College Institute, at John Jay College, Lehman College and Medgar Evers Community College, offered students an opportunity to improve their basic skills, their test-taking skills, and develop career plans. Finally, the Summer '83 Mathematics and

Science Institute at Borough of Manhattan Community College was another supplemental instructional program which included laboratory work in science and computer science, language arts, techniques of research and mathematics. Students submitted a detailed research proposal which will eventually culminate in a research paper.

Participation rates in the above interventions varied greatly, depending on budgetary considerations, availability of time, class schedules, interest, timely planning and recruitment efforts. The number of participants in any one intervention ranged from a low of 29 (for the '83 Summer Institute) to a high of 87 (for the Spring '82 Bridge Project). Overall, the completion rate for the four interventions was 84%, an impressive figure considering that students had to travel to CUNY colleges for supplemental instruction, that some of the activities took place on weekends, and that a majority come from schools with high truancy and dropout rates.

TABLE 3

URBAN PROJECT PARTICIPATION AND COMPLETION RATES

Intervention	Number of Participants*	Completers	
		N	%
Spring '82 Bridge Project	87	81	93.1
'82 Summer Institute	36	31	86.1
Spring '83 Precollege Institute	48	30	62.5
'83 Summer Institute	29	26	89.6
Total	200**	168	84.0%

*Of the 156 selected to participate, 28 have had no intervention, to date.

**The total of 200 represents frequency of participation rather than actual number of participants.

The Spring '82 Bridge Project not only drew the largest percentage of participants but had the largest percentage of completers (93.1%). The Spring '83 Precollege Institute had the smallest percentage of completers (62.5%).

Table 4 below reveals that of the four interventions available, almost two-thirds of the students participated in only one while the other third were involved in two or more.

TABLE 4

NUMBER OF INTERVENTIONS ATTEMPTED
BY URBAN PROJECT PARTICIPANTS

	Number of Interventions				Total
	1	2	3	4	
Number of Participants	81	29	12	6	128
	(63.3%)	(22.7%)	(9.3%)	(4.7%)	(100.0%)

CDDP Retention

Four semesters after the inception of the Urban Project, over 82% of the participants have been retained in CDDP and, by definition, in their respective high schools through the eleventh (Junior) grade.

This finding is significant in view of the staggering number of high school students who drop out (about 55%, based on NYC Board of Education figures), particularly in the sophomore (10th) year. CUNY UAPC statistics on the NYC Board of Education High School Division reveal that: (1) the longer a student remains in school the greater the chance for graduation; (2) the sophomore year dropout rate is inordinately high; and (3) the dropout rate for Blacks and Hispanics is very high. By comparison, Urban Project participants are not only retained in their respective high schools but in the Special Programs designed to motivate and prepare them for college. Even more impressive is the fact that for the approximately 67% of Urban Project students who come from

the three Chapter I schools with known high dropout rates, (Thomas Jefferson, Theodore Roosevelt, and Seward Park), almost 79% have been retained.

TABLE 5

URBAN PROJECT STUDENT RETENTION IN CDDP*
BY HIGH SCHOOL AND SEMESTER

High School	Urban Project Enrollment	SEMESTER COMPLETED**							
		Fall 10		Spring 10		Fall 11		Spring 11	
		N	%	N	%	N	%	N	%
Theodore Roosevelt	30	27	90.0%	26	86.6%	25	83.3%	18	60.0%
Thomas Jefferson	32	32	100.0	28	87.5	27	84.4	26	81.2
Seward Park	30	30	100.0	29	96.7	27	90.0	28	93.3
Jamaica	25	25	100.0	25	100.0	25	100.0	23	92.0
Port Richmond	13	12	92.3	12	92.3	12	92.3	12	92.3
Total	130***	126	97.0%	120	92.3%	116	89.2%	107	82.3%

* Enrollment in CDDP presupposes enrollment in high school. CDDP dropout however, does not necessarily presuppose high school dropout.

** Completion rates are based on initial enrollment.

*** The above table does not include the 26 Urban Project students who entered the Project after the original pool of 130. CUNY's OSP is in the process of collecting demographic and academic achievement data on these students.

Overall, retention steadily decreased from the Fall tenth to the Spring eleventh year semester. The greatest loss of students, however, occurred somewhere after the Fall eleventh and before or during the Spring eleventh semester, primarily at one school, Theodore Roosevelt.

Seward Park, a Chapter I school, had the highest rate of retention after four semesters (93%). Conversely, Theodore Roosevelt, another Chapter I school, had the lowest (60%).

Summary

Data reveal that an overwhelming majority of Project participants have been retained in the Project and in their respective high schools. These findings are very encouraging since the high school dropout rate in general is very high and, in particular, from those schools in which the majority of participants are enrolled.

Recommendations

The following are recommendations based on findings above.

- Compare persistence patterns between the treatment group and a comparison group of CDDP Urban Project eligible "non-participants." Both groups should be

longitudinally followed through high school and college.

- Interview a sample of Urban Project students representative of the following groups:
  (1) participants who have had varying degrees of intervention;
  (2) Project dropouts; and
  (3) high school dropouts.

  Future program planning will be enhanced by knowing which aspects of the Project were successful in meeting students' needs and which could be improved, expanded upon or deleted.

- Interview a sample of Urban Project students representing the various ethnic and national origin groups. It is noteworthy that seven of the 18 Asian students selected to participate either had "no intervention" or "dropped out" of the program, a disproportionately high figure. It may prove valuable to interview members of this group in particular, to find out why they dropped out and what could be done in the future to better serve their needs.

- Ascertain why the Spring '82 Bridge Project intervention had many more participants than the other interventions.

- Ascertain why the dropout rate in the Spring '83 Precollege Institute was considerably higher than for the other interventions.

- Explore the reason for the disproportionately high attrition rate from Roosevelt High School's CDDP Program between the Fall and Spring eleventh year semesters.

ACADEMIC ACHIEVEMENT PROFILE

Since issuing the first student profile report, which tracked academic achievement through the tenth or sophomore year (June '82), students have completed their eleventh or junior year in high school (June '83).

This section highlights eleventh year academic performance, notes trends and makes recommendations.

Urban Project students will soon be applying to colleges, many to CUNY and its Special Programs (SEEK or College Discovery). As an indication of preparedness for college level work and of the effectiveness of the Urban Project in motivating and preparing participants to pursue math and science courses in high school, this section will also examine the number of college preparatory course sequences completed in math and science*.

English, Math and Science Grades

Table 6 on the following page includes student performance data from the ninth through the eleventh grade. The graph following characterizes grade trends in math, science and English for the five semesters tracked.

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* Course sequence completion is defined as having receive passing grades for two semesters in a specific math or science subject, i.e. geometry, chemistry or physics.

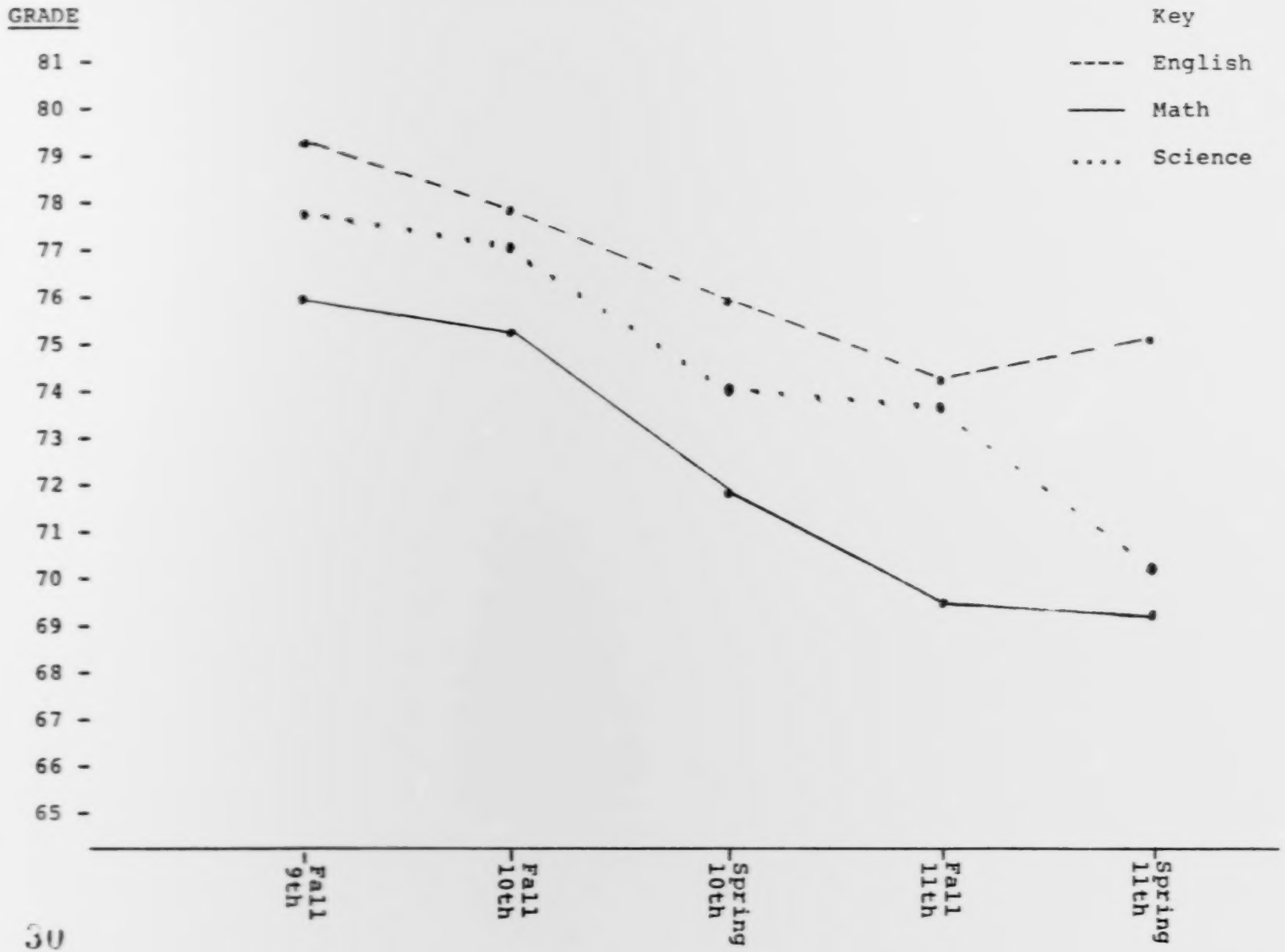
TABLE 6

NINTH THROUGH ELEVENTH YEAR GRADES IN ENGLISH, MATH AND SCIENCE

Subject Area	Fall 9th Semester N	Fall 9th Semester $\bar{X}$ Grade	Fall 10th Semester N	Fall 10th Semester $\bar{X}$ Grade	Spring 10th Semester N	Spring 10th Semester $\bar{X}$ Grade	Fall 11th Semester N	Fall 11th Semester $\bar{X}$ Grade	Spring 11th Semester N	Spring 11th Semester $\bar{X}$ Grade
Overall GPA in three major subject areas: English, mathematics and science	121	78.1	125	76.8	125	73.7	95	72.6	91	72.3
English	116	79.3	120	77.9	116	76.1	93	74.5	89	76.3
Mathematics										
General Math	29	75.7	1	70.0	0	-	0	-	0	-
9th year Algebra	65	77.5	77	75.9	73	70.7	21	60.9	9	55.4
10th year Geometry	3	81.7	41	74.5	50	73.5	46	71.7	47	66.5
11th year Math*	0	-	0	-	0	-	22	74.8	23	78.2
12th year Math	0	-	0	-	0	-	2	55.0	3	88.3
Course Type Unknown	19	70.0	1	75.0	0	-	0	-	0	-
Total: All Courses	116	76.0	20	75.5	123	71.8	91	69.6	82	69.4
Science										
General Science	108	77.4	2	82.5	2	82.5	0	-	3	66.7
Biology, Ecology, Zoology or Life Science	6	87.8	113	76.9	115	73.9	13	79.1	16	74.6
Physics	0	-	0	-	0	-	8	78.4	8	69.6
Chemistry	0	-	5	90.8	5	90.4	55	71.4	49	69.5
Total: All Courses	114	77.8	120	77.2	122	74.1	76	73.8	76	70.5

*Intermediate Algebra, Trigonometry or Calculus

ENGLISH, MATHEMATICS AND SCIENCE GRADE
DISTRIBUTION OVER A FIVE SEMESTER PERIOD



For the five semesters tracked overall grade point averages ranged from 72 to 78. Generally, except for a rebound in English from Fall to Spring in the eleventh year, students' grades in math, science and English gradually declined over the five semesters tracked (see graph). In math, the decline in grades across the three years is essentially due to the decline in the grades of a particular subpopulation, the large proportion who repeat courses they failed and who are therefore consistently taking courses appropriate to lower grades later in their high school careers, for example, those who are taking "ninth-year" algebra in the eleventh year. Over half the eleventh grade students took tenth year geometry or ninth year algebra rather than a math course designed for and appropriate to the eleventh grade.

For each semester tracked, students' English grades were highest, fol. .ed by science, with math consistently lowest. (See graphic representation.)

Although grades declined over the five semesters, many Project participants are taking and completing advanced college preparatory courses in math and science.

Correspondence Between Semester and Mathematics Course Type

Students can be placed either in a two or three semester algebra sequence. Those placed in the three semester sequence

are most likely not eligible to take geometry until the 11th year in high school, thereby making it impossible to complete the required math sequence for college. A review of records revealed the presence of students who were placed in a three semester sequence although they had consistently attained high grades in all math courses (85+) prior to taking algebra.

Academic Preparation in Math and Science: A Comparison of Urban Project Students and the 1980 CUNY Entering Class

The amount of academic preparation for college provides an important indication of how well prepared students are to perform competitively in college and how much remediation work they will require.

CUNY's Office of Institutional Research and Analysis (OIRA) recently completed a study on the 1980 CUNY regularly admitted and Special Program students* which includes an analysis of the level and type of math and science preparation received in high school by both groups. It seems appropriate to use these findings as yardsticks against which to measure the amount of

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* Lavin, D.; Protash, W.; Kramer R.; Bhouraskar, G. Report on Socioeconomic Origins and Educational Background of an Entering Class at CUNY: A Comparison of Regular and Special Program Students. CUNY OIRA, Spring 1983.

math and science preparation of Urban Project students since a majority of Project participants will be entering CUNY in Fall 1984, many as SEEK or CD students.

The reader is advised to view the data cautiously since comparisons are made between the 1980 CUNY entering class and students who will first be entering CUNY in 1984.

Tables 7 and 8 compare the level of math and science preparation, respectively, of the Urban Project students and the 1980 CUNY incoming class of senior and community college regularly admitted and Special Programs students.

TABLE 7

HIGH SCHOOL MATHEMATICS PREPARATION OF URBAN PROJECT STUDENTS AFTER COMPLETION OF THE ELEVENTH OR JUNIOR YEAR (JUNE '83) COMPARED WITH 1980 CUNY REGULAR AND SPECIAL PROGI ENTERING FRESHMEN*

		Sen r Colleges		Community Colleges	
Highest Level Completed**	Urban Project	Regular	SEEK	Regular	CD
Did not complete 9th year math	18%	8%	43	21%	52%
Completed 9th year math (Algebra)	37	18	35	34	38
Completed 10th year math (Geometry)	27	21	13	20	7
Completed 11th year math or higher (Intermediate Algebra or Trigonometry or Calculus)	18	53	9	25	3
(N)	(130)	(3075)	(1406)	(6464)	(680)

(x^2 = 2142.814, $p < .001$, 12df)

* Source for CUNY entering Freshmen: Lavin, D.; Protash, W.; Kramer, R.; Bhouraskar, G. Report on Socioeconomic Origins and Educational Background of an Entering Class at CUNY: A Comparison of Regular and Special Program Students. CUNY Spring '83, p. 30.

** Course completion rates for the 1980 CUNY entering class are based upon those completed at the time of application to CUNY and do not necessarily reflect all work done in the senior year of high school.

TABLE 8

HIGH SCHOOL SCIENCE PREPARATION OF URBAN PROJECT
STUDENTS AFTER COMPLETION OF THE ELEVENTH OR JUNIOR YEAR (JUNE '83)
COMPARED WITH 1980 CUNY REGULAR AND SPECIAL PROGRAM ENTERING FRESHMEN*

		Senior Colleges		Community Colleges	
Highest Level Completed**	Urban Project	Regular	SEEK	Regular	CD
Did not complete Biology	15%	26%	61%	61%	65%
Completed Biology***	36	32	29	27	30
Completed Chemistry, Physics or both	49	43	10	12	5
(N)	(130)	(3075)	(1406)	(6464)	(680)

(x^2 = 1778.287, p .001, 8df)

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* Source for CUNY entering Freshmen: Ibid., p. 25.

** Course completion rates for the 1980 CUNY entering class are based upon those completed at the time of application to CUNY and do not necessarily reflect all work done in the senior year of high school.

*** CUNY's OSP database uses the same code for biology, ecology, zoology and life science courses. A telephone sampling of three of the five schools indicated, however, that a vast majority of students completed biology.

The data in Table 7 indicate that Urban Project students are much better prepared for college-level work in mathematics than either entering SEEK or College Discovery students and roughly equivalent in level of preparation to regularly admitted community college students. A chi square (x^2) analysis of the differences between groups in proportions of students reaching various levels of mathematics preparation was significant at the .001 level ($x^2 = 2142.814$, $p < .001$, 12df).

While 18% of the Urban Project group have not yet completed ninth year math (algebra), 43% of the 1980 SEEK and 52% of the CD entering class did not do so. Moreover, almost a quarter of the Project students completed geometry compared with 13% of SEEK and 7% of the CD students. Even when compared to regularly admitted community college students the level of academic preparation in math is greater for Urban project students. The only group more prepared than the Urban Project group are the students regularly admitted to the senior colleges.

In the area of science Urban Project participants completed more advanced science course sequences than any category of 1980 CUNY entering freshmen ($x^2 = 1718.287$, $p < .001$, 8df). In fact, 49% have already completed chemistry, physics or both compared to 43% of regularly admitted senior college students and 12% of regularly admitted community college students. Only 10% of SEEK and 5% of CD students completed chemistry or physics.

What the findings above suggest is that the Urban Project may be a motivating force behind students completing more college preparatory courses in math and science than their counterparts who enter CUNY.

The challenge that the Urban Project group will provide for CUNY's Special Programs is to meet the more advanced needs they will bring with them to college.

Already, SEEK and CD Programs have begun altering their program offerings as a result of their Urban Project experiences with high school students on CUNY campuses. In addition, several CUNY SEEK Programs (City, Lehman, John Jay and York) have begun an examination of their college math sequences in order to improve the academic preparation of their students who might be qualified to pursue careers in math, science or the technologies.

Academic Preparation in Math and Science: A Comparison of All CDDP Centers Combined and Individual Centers

Not all of the CDDP high schools afforded the same level of math and science preparation to its students. The data on math and science course sequence completion by high school are presented for the benefit of Urban Project planners and for high school staff involved in math and science curriculum design, but must be viewed cautiously. Whether differing levels of preparation in math and science are a result of students' prior

preparation and skill level attainment or the result of other factors is as yet unknown.

Table 9 compares the level of math and science preparation of Urban Project students at all high schools combined and at individual high schools through the eleventh grade.

TABLE 9

HIGH SCHOOL MATHEMATICS AND SCIENCE PREPARATION OF URBAN PROJECT STUDENTS: COMPARISON OF ALL CDDP HIGH SCHOOLS COMBINED AND INDIVIDUAL HIGH SCHOOLS

Highest Level Completed	All Centers Combined	Theodore Roosevelt	Thomas Jefferson	Seward Park	Jamaica	Port Richmond
Mathematics						
Did not complete 9th year math	18%	37%	22%	7%	12%	8%
Completed 9th year math (Algebra)	37	53	34	20	48	23
Completed 10th year math (Geometry)	27	10	28	23	24	31
Completed 11th year math or higher (I.A., Trigonometry or Calculus)	18	0	16	50	16	38
				(x^2 = 37.869, $p < .001$, 12df)		
Science						
Did not complete Biology, Ecology, Zoology or Life Science	15%	23%	25%	7%	0%	15%
Completed Biology, Ecology, Zoology, or Life Science	36	53	16	53	44	0
Completed Chemistry, Physics or both	49	23	59	40	56	85
				(x^2 = 31.224, $p < .001$, 8df)		
N:	(130)	(30)	(32)	(30)	(25)	(13)

The preceding table shows that Seward Park and Port Richmond students completed more advanced math course sequences than their counterparts while Roosevelt students completed fewer. One half of the students from Seward Park and over one third from Port Richmond successfully completed an eleventh year math sequence. Conversely, over one third of the students from Roosevelt have not yet completed ninth grade algebra. A chi square analysis was significant beyond the .001 level ($x^2 = 37.869$, $p < .001$, 12df).

In science, students from Port Richmond, Thomas Jefferson and Jamaica completed more college preparatory science courses than their counterparts. Eighty-five percent (85%) of Port Richmond students completed chemistry, physics or both; comparable figures for Thomas Jefferson and Jamaica are 59 and 56%, respectively. Again the chi square analysis showed statistical significance beyond the .001 level ($x^2 = 31.224$, $p < .001$, 8df).

Math and Science Preparation by Gender

The sexes were roughly equivalent in the amount of mathematics and science preparation received. A chi square analysis revealed no significant differences between the genders (x^2 math = 4.155, $p > .10$, 3df; x^2 science = .347, $p > .10$, 2df).

TABLE 10

MATHEMATICS AND SCIENCE
PREPARATION OF URBAN PROJECT STUDENTS BY GENDER

Highest Level Completed	Females	Males
Mathematics		
Did not complete 9th year math (Algebra)	20%	16%
Completed 9th year math (Algebra)	30	47
Completed 10th year math (Geometry)	31	21
Completed 11th year math or higher (Intermediate Algebra, Trigonometry or Calculus)	19	16
	(x^2 = 4.155, $p > .10$, 3df)	
Science		
Did not complete Biology, Ecology Zoology or Life Science	15	14
Completed Biology, Ecology, Zoology or Life Science	34	39
Completed Chemistry, Physics or both	51	47
(N)	(73)	(57)
	(x^2 = .347, $p > .10$, 2df)	

The above findings are significant in that men predominate in the science and technology fields while women are greatly underrepresented. It appears that Urban Project females have the potential and academic preparation to pursue advanced math and science studies in college.

Correspondence Between Number of Students Taking Math and Science Regents and Courses

The New York State High School Regents Examinations are used by many colleges, particularly private ones, in their student selection process. The number and type of exams taken and grades received may make the difference between acceptance and non-acceptance.

An analysis of the number of tenth grade Urban Project students enrolled in algebra and biology courses and taking corresponding Regents Exams reveals the following:

- Approximately 53 percent of the students enrolled in biology courses took the Regents;

- Approximately 55 percent of the students enrolled in algebra also attempted the Algebra Regents.

According to the CDDP Coordinators, these figures represent an increase over previous years.

Discrepancy Between Course Grades and Regents Grades in Math and Science

Table 11 shows that there is a difference between math and science course grades and corresponding Regents grades, with Regents grades generally about 10 points lower.

TABLE 11

COMPARISON OF MATH AND SCIENCE REGENTS GRADES AND CORRESPONDING COURSE GRADES IN TENTH AND ELEVENTH YEARS

	Tenth Grade			Eleventh Grade		
Subject	N	Mean Course Grade	Mean Regents Grade	N	Mean Course Grade	Mean Regents Grade
Mathematics						
Algebra	45	75.0	65.1	13	65.0	53.2
Geometry	19	79.6	79.2	27	68.2	51.6
11th year Math	0	-	-	9	79.3	70.4
Total	64	77.2	69.6	49	69.7	55.4
Science						
Biology	60	75.9	65.1	6	75.8	58.1
Chemistry	4	87.3	85.0	26	69.0	65.5
Physics	0	-	-	6	72.8	75.0
Total	64	76.6	66.6	38	70.7	65.6

The discrepancy between course and corresponding Regents grades is particularly large for students in the eleventh grade who took a math or science course and Regents Exam designed for and appropriate to a lower grade, for example students who were taking algebra, geometry or biology. In each case, the grade differences were not only large, (anywhere from 12 to 17 points) but the mean Regents grade was failing while the course grade was passing.

On the other hand, students who had a better match between course grades and Regents grades were usually those who were taking courses appropriate to or above their grade level, for example, those taking geometry or chemistry in the tenth grade.

Computer Courses Completed

The Urban Project encourages its students to enroll in courses on computer literacy at their respective high schools while exposing them to computers at the various CUNY colleges.

To date, sixteen (16) students have taken one or more courses at two high schools, Jamaica and Seward Park.

Summary

Performance data indicate that, overall, grade point averages in English, math and science for the five semesters

tracked ranged from 72 to 78. Although grades gradually declined over the three years, a large percentage of students completed the more difficult college preparatory courses in math and science, such as geometry, physics and chemistry.

In fact, when compared to the 1980 CUNY entering class Project participants are much better prepared in math and science than either SEEK or CD students; in science they have more academic preparation than those regularly admitted to the senior colleges.

Several high schools are outstanding when measured by the level of math or science preparation attained by Urban Project students: Seward Park and Port Richmond in math; Port Richmond, Thomas Jefferson and Jamaica in science.

An analysis of gender differences in the amount of math and science college preparatory courses completed reveals that the sexes are roughly equivalent in the amount of math and science preparation received.

For students who attempted math and science courses and corresponding Regents Exams there was a difference between courses grades and Regents grades, with Regents grades generally about 10 points lower.

Finally, it was important for Urban Project planners to know how many students took computer courses in high school, since the Project emphasizes and encourages computer literacy. Sixteen (16) students have taken one to four computer courses at two high schools, Jamaica and Seward Park.

Recommendations

The following recommendations emanate from findings in the preceding section on student achievement. Research issues and concerns are included.

- Compare Urban Project Academic performance with that of the larger CDDP population over the same five semesters. Assuming corroborative findings that reveal a "downward" trend in academic performance, conduct a study to determine reasons; develop appropriate strategies and timely interventions to maximize student performance and retention.

- Study the procedures used to place students in math courses since data indicated that there were students who were placed in three semester algebra tracks even though they had consistently attained high grades (85+) prior to taking algebra.

- Compare the level of high school math and science preparation of CUNY regularly admitted, Special Programs and Urban Project students who will enter the University in 1984.

- Examine the relationship between course grades and Regents Exam grades for the larger CDDP population to ascertain how widespread grade discrepancies are and the factors involved.

- Collect math and science course completion data for the larger CDDP population to determine whether the findings that Urban Project students are better prepared academically in math at Port Richmond and Seward Park and in science at Thomas Jefferson, Jamaica and Seward Park remain consistent. In the event they do, conduct a curriculum review at the high schools to determine the factors which contribute to these results and if they can be replicated across programs.

- Conduct a seminar for CUNY Special Programs staff on the needs of the 1984 incoming students from the Urban Project and planning strategies.

- Encourage more of the high schools to offer computer literacy courses. Perhaps Jamaica and Seward Park could be invited to make presentations to the other high schools on their computer course capabilities.

- Offer an incentive for students to participate in the Project in the form of a stipend and/or college credit for completion of the Program.

- Continue staff development workshops and educational policy seminars to enable Project staff to share ideas, plan jointly and remain alert to the latest developments in the math and science fields.

- Add student attitudinal variables to the existing database. Knowledge of how students perceive themselves as learners and pre/post attitudinal measures will provide a more comprehensive picture of students' development and attitudinal impact on school achievement.

CONCLUSION

It is anticipated that this report, the second in a series of profile reports, will be utilized by Project administrative and teaching staff to assess student needs, plan appropriately and link entering student characteristics with subsequent Project results and academic performance.

The Urban Project has begun the long process of systematically tracking its students and linking clusters of variables to understand the process most likely to produce success in math and science for Urban minority high school students.